

What is claimed is:

- 1 1. A liquid crystal display device having a driving
2 circuit and a plurality of pixel units formed in
3 combination, capable of accepting a digital signal input,
4 comprising:
5 at least one pulse generator for generating a sample
6 pulse which samples in time series an input
7 digital signal corresponding to a pixel;
8 at least one sampler for sampling the input digital
9 signal in response to the sampling pulses;
10 at least one comparator receiving a sampled digital
11 signal for comparison with a reference voltage,
12 and outputting a comparison result;
13 at least one latch for holding the comparison result;
14 and
15 at least one digital-to-analog converter generating an
16 analog signal based on the received digital
17 signal, then applying the analog signal to a
18 corresponding pixel.
- 1 2. The liquid crystal display device of claim 1
2 further comprising analog buffers for receiving the analog
3 signal generated from the digital-to-analog converter and
4 applying the analog signal to a corresponding pixel.
- 1 3. The liquid crystal display device of claim 1
2 further comprising level converters for converting the held
3 digital signal to a signal having a high signal level and
4 outputting the signal to the digital-to-analog converter.

1 4. The liquid crystal display device of claim 1
2 wherein the level of the reference voltage is half the
3 amplitude of the input digital signal.

1 5. The liquid crystal display device of claim 1
2 wherein the sampler is a switch.

1 6. The liquid crystal display device of claim 1
2 wherein the pulse generator is a shift register.

1 7. A liquid crystal display device having a driving
2 circuit and a plurality of pixel units formed in
3 combination, capable of accepting a digital signal input,
4 comprising:

5 a shift register for generating a sample pulse which
6 samples in time series an input digital signal
7 corresponding to a pixel;

8 a data bus;

9 a set of switches for sampling an input digital signal
10 in the data bus in response to the sampling
11 pulses, wherein the number of the switches is
12 equal to the number of data lines in the liquid
13 crystal display device;

14 a set of comparators, each coupled to one switch,
15 having a first input terminal for receiving a
16 digital signal sampled by the corresponding
17 switch and a second input terminal for receiving
18 a reference voltage, and comparing the digital
19 signal and the reference voltage to output a
20 comparison result;

21 a set of latches, each coupled to one of the
22 comparators, for holding the comparison result;
23 and
24 a set of digital-to-analog converters, each coupled to
25 one of the latches for generating an analog
26 signal based on a digital signal held by the
27 corresponding latch and applying the analog
28 signal to a corresponding pixel.

1 8. The liquid crystal display device of claim 7
2 further comprising a set of analog buffers, each coupled to
3 one of the digital-to-analog converters for receiving the
4 analog signal generated from the corresponding digital-to-
5 analog converter and applying the analog signal to a
6 corresponding pixel.

1 9. The liquid crystal display device of claim 7
2 further comprising a set of level shifts, each coupled
3 between one of the latches and one of the digital-to-analog
4 converters for amplifying the digital signal held by the
5 corresponding latch to a signal having a high signal level
6 and outputting the signal to the corresponding digital-to-
7 analog converter.

1 10. The liquid crystal display device of claim 7
2 wherein the level of the reference voltage is half the
3 amplitude of the input digital signal.